RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2 Exhibit)

February 1999

BUDGET ACTIVITY

PE NUMBER AND TITLE

5 - Engineering and Manufacturing Development

0604740F Computer Resources Mgt Tech

				or in the company of the control of								
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost		
Total Program Element (PE) Cost	3,796	2,194	196	216	235	254	274	293	Continuing	Continuing		
2522 Advanced Computer Technology Transition	676	0	0	0	0	0	0	0	0	4,381		
2523 Architectural Implementation	684	2,194*	196	216	235	254	274	293	Continuing	Continuing		
2524 Reuse and Component Support (RCS)	2,436	0	0	0	0	0	0	0	0	12,259		
Quantity of RDT&E Articles	0	0	0	0	0	0	0	0	0	0		

^{*} Congress added an additional \$2.0 million in FY99 for the National Product Line Asset Center (NPLACE). These funds were inadvertently placed in project 2523 as opposed to project 2524. Funds will be transferred to project 2524 at the earliest opportunity.

(U) A. Mission Description

A major restructuring of this program into an Integrated Command and Control Applications (IC2A) program in support of Command and Control Centers is currently in process. The goal of this program is to dramatically reduce the development time, costs, and risks associated with the acquisition and development of warfighting command and control (C2) systems by using families of pre-defined product lines to enhance common application use and reuse. As part of this, Project 2522 was merged and funding was transitioned to Project 2523, to be renamed Command and Control Product Lines (CCPL). The CCPL project minimizes development cost and time by using pre-defined product line architectures with tested, reusable software components from mature programs. The use of common product line designs during development can improve software quality and reliability while reducing fielding times and overall life cycle costs. Project 2524, Reuse and Component Support (RCS) identifies, tests, and provides reusable software components and products to the IC2A program. The RCS project developed a software reuse strategy for the DoD; and is developing a National Product Line Asset Center (NPlace) Software Reuse Repository to manage a command center product line based on primarily commercial off-the-shelf (COTS) products. The IC2A program has determined that over 80% of the functionality of any command center software is common to all command centers. For programs using product line concepts, average savings of 56% in development costs and 66% in development time can be realized.

(U) B. Budget Activity Justification:

This program is in budget activity 5 - Engineering and Manufacturing Development, due to the nature of the effort.

Page 1 of 14 Pages

Exhibit R-2 (PE 0604740F)

BUDGET ACTIVITY	STIFICATIO	DATE February 1999			
		PE NUMBER AN		·	
5 - Engineering and Manufacturing Develop	nent	0604740F	Mgt Tech		
(U) C. <u>Program Change Summary (\$ in Thousands)</u>					
					Total
	<u>FY 1998</u>	FY 1999	<u>FY 2000</u>	<u>FY 2001</u>	Cost
(U) Previous President's Budget FY 1999 PB	4,159	200	0	0	Continuing
(U) Appropriated Value	4,459	2,200			
(U) Adjustments to Appropriated Value					
a. Cong Reductions	-146	-6			
b. SBIR	-109				
c. Omnibus or Other Above Threshold Reprogram	-11				
d. Below Threshold Reprogramming	-397				
U) Adjustments to Budget Years Since FY 1999 PB			196	216	
U) Current Budget Submit/FY 2000 PB	3,796	2,194	196	216	Continuing
FY99: SBIR \$70 identified as source.					
FY99: SBIR \$70 identified as source.					
FY99: SBIR \$70 identified as source.					
FY99: SBIR \$70 identified as source.					
FY99: SBIR \$/0 identified as source.					
FY99: SBIR \$70 identified as source.					
FY99: SBIR \$/0 identified as source.					
FY99: SBIR \$/0 identified as source.					

RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) PE NUMBER AND TITLE PROJE PROJ												
BUDGET ACTIVITY 5 - Engineering and Manufacturing De	evelopm	ent			TITLE Computer	Resour	ces Mgt 1	Гесһ		PROJECT 2 522		
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost		
2522 Advanced Computer Technology Transition	nced Computer Technology Transition 676 0 0 0 0 0 0 0					0	4,3					
(U) FY 1998 (\$ in Thousands):												

Project 2522 Page 3 of 14 Pages Exhibit R-2 (PE 0604740F)

DATE RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) February 1999 BUDGET ACTIVITY PE NUMBER AND TITLE PROJECT 0604740F Computer Resources Mgt Tech 2522 5 - Engineering and Manufacturing Development (U) B. Project Change Summary - Description of Significant Changes: Project 2522 transitioned to Project 2523 (U) C. Other Program Funding Summary (\$ in Thousands) Not applicable. (U) D. Acquisition Strategy: All major contracts within this Program Element were awarded after full and open competition. (U) E. Schedule Profile Not applicable. This is a support and management level of effort program. All activities are ongoing. Exhibit R-2 (PE 0604740F) Project 2522 Page 4 of 14 Pages

RD	T&E PRO	GRAM EL	EMENT/F	PROJE	CT COS	T BRE	٩KD	OWN (R-	3)	DATE F	ebruary 19	999
BUDGET ACTIVITY 5 - Engineerir	ng and Manu	ufacturing	Developme	ent		UMBER AND)4740F (outer Resc	ources Mgt	Tech		PROJECT 2 522
(U) A. Project Co	ost Breakdown	(\$ in Thousan	<u>ds)</u>									
				<u>FY</u>	<u>′ 1998</u>	FY 1999		FY 2000	FY 2001			
(U) Continued dev	-	nnology infrast	ructure		180	0		0	0			
the Air Force. U) Update to existing architecture to accommodate new technologies. U) Upgrade to existing component structure to allow for new					320	0		0	0			
(U) Upgrade to existing component structure to allow for new technologies.					176	0		0	0			
technologies. (U) Total					676	0		0	0			
(U) B. Budget Ac	cquisition Histor	ry and Plannii	ng Information	ı (\$ in Tho	ousands)							
Performing Organ	nizations:											
Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	To Prior <u>FY 19</u>		ıdget 1998	Budget <u>FY 1999</u>	Budget FY 2000	Budget <u>FY 2001</u>	Budget to Complete	Tota <u>Progran</u>
Product Developm	ent Organization	S										
Universal SCA AGCS Martin Marietta Hughes Aircraft	CP CP FFP CPFF	Dec 94 Jan 95 22 Oct 94 19 Dec 92	N/A N/A N/A N/A	N/A N/A N/A	2	75 50 213 282	0 0 0 220	0 0 0	0 0 0	0 0 0 0	0 0 0 0	75 50 213 502
Raytheon Co. Unisys TRW	CPFF CPFF CPFF	19 Dec 92 19 Dec 92 29 Sep 93 20 Feb 97	N/A N/A N/A N/A	N/A N/A N/A	8	282 391 560 0	200 200 0 256	0 0 0	0 0 0	0 0 0	0 0 0	1,091 660 256
Lockheed Martin	CP	Var	N/A N/A	N/A N/A		0	0	0	0	0	0	(
Project 2522					Page 5 of	14 Pages			Exhi	bit R-3 (PE	0604740F)	

RD	T&E PRO	GRAM EL	.EMENT/F	PROJEC	T COST B	DATE F	February 1999					
BUDGET ACTIVITY 5 - Engineerin	g and Manu	ıfacturing	Developme	ent		R AND TITLE	uter Resc	ources Mg	t Tech	PROJECT 2522		
Contractor or Government Performing <u>Activity</u>	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity EAC	Project Office <u>EAC</u>	Total Prior to <u>FY 1998</u>	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget <u>FY 2001</u>	Budget to Complete	Total <u>Program</u>	
Support and Manag	gement Organiza	utions										
OO-ALC SENCOM MOSAIC (TEMS) JLC SEI Sterling ATTI ESC Test and Evaluation Not applicable. Government Furni		Var Jan 95 Jan 95 Var Var Var Var N/A	N/A N/A N/A N/A N/A N/A N/A	N/A N/A N/A N/A N/A N/A N/A	157 25 415 230 185 0 0 522	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	0 0 0 0 0 0 0	157 25 415 230 185 0 0 522	
Not applicable. Subtotal Product De Subtotal Support an Subtotal Test and E Total Project	nd Management				2,171 1,534 0 3,705	676 0 0 676	0 0 0	0 0 0	0 0 0	0 0 0	2,847 1,534 0 4,381	
Project 2522					Page 6 of 14 Pa	iges		Ext	nibit R-3 (PE	: 0604740F)		

RDT&E BUDGET IT	February 1999										
BUDGET ACTIVITY 5 - Engineering and Manufacturing Development PE NUMBER AND TITLE 0604740F Computer Resources Mgt Tech 2523										ROJECT 2 523	
COST (\$ In Thousands)	FY 1998 Actual	FY 1999 Estimate	FY 200 Estima		FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	Cost to Complete	Total Cost
2523 Architectural Implementation	684	2,194*		196	216	235	254	274	293	Continuing	Continuing

^{*} Congress added an additional \$2.0 million in FY99 for the National Product Line Asset Center (NPLACE). These funds were inadvertently placed in project 2523 as opposed to project 2524. Funds will be transferred to project 2524 at the earliest opportunity.

(U) A. Mission Description

As part of the restructuring of this program (see page 1), this project will be renamed Command and Control Product Lines (CCPL). The CCPL project forms a vital component of the Integrated Command and Control Applications (IC2A) program by providing pre-defined product line architectures with tested, reusable software components to build Command and Control (C2) systems. Using rapid prototyping techniques, a CCPL contractor can quickly tailor a product line to the warfighter's needs and deliver an integrated, combat-ready system. All product lines and components are based on Defense Information Infrastructure Common Operating Environment (DII COE) principles; make maximum use of open system architectures, industry standards, Commercial Off-the Shelf (COTS) products, and government furnished equipment; and incorporate multilevel security (MLS) features. CCPL minimizes development risks by reusing proven software components from mature programs and by continuously testing new products and technologies against the product line designs to ensure integration and interoperability. The CCPL contractors develop and maintain the C2 product line infrastructure in a collaborative, synergistic environment using validated, mature software engineering processes to help ensure the quality of the designs and components. Proven product line designs and tested software components reduce development costs, risks, and time for the user. New technologies, capabilities, and incremental developments are assessed and integrated into the designs as part of the product line development process to minimize any impact to the user.

(U) <u>FY 1998 (\$ in Thousands)</u>:

- (U) \$ 340 Qualify components for CCPL
- (U) \$ 344 Integrate products into CCPL
- (U) \$ 684 Total

(U) <u>FY 1999 (\$ in Thousands)</u>:

- (U) \$ 200 Qualify components for CCPL
- (U) \$ 360 Identify Enterprise Wide Assets (From COTS, GOTS, Product line engineering centers).
- (U) \$ 1,320 Perform suitability testing against product line architectures, assets, criteria, and design.
- (U) \$ 244 Maintain repository/distribute product line architecture, assests, criteria, and design.
- (U) \$ 70 Identified as a source for SBIR.
- (U) \$ 2,194 Total

Project 2523 Page 7 of 14 Pages Exhibit R-2 (PE 0604740F)

DATE RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) February 1999 BUDGET ACTIVITY PE NUMBER AND TITLE **PROJECT** 0604740F Computer Resources Mgt Tech 5 - Engineering and Manufacturing Development 2523 (U) FY 2000 (\$ in Thousands): Qualify components for CCPL (U) \$ 196 (U) \$ 196 (U) FY 2001 (\$ in Thousands): Qualify components for CCPL (U) \$ 216 (U) \$ 216 (U) B. Project Change Summary - Description of Significant Changes: Funding was restored to FY00 - FY05 to facilitate the restructuring of this program. Congress added an additional \$2.0 million into the FY99 program for the National Product Line Asset Center (NPLACE). (U) C. Other Program Funding Summary (\$ in Thousands) Not applicable. (U) D. Acquisition Strategy: All major contracts within this Program Element were awarded after full and open competition. (U) E. Schedule Profile Not applicable. This is a support and management level of effort program. All activities are ongoing.

Page 8 of 14 Pages

Project 2523

Exhibit R-2 (PE 0604740F)

RD	T&E PRO	GRAM EL	.EMENT/F	PROJ	ECT C	OST	BREA	KD	OWN (R-	3)	DATE	February 1	1999
BUDGET ACTIVITY 5 - Engineerir	ng and Manu	ıfacturing	Developme	ent			BER AND T		outer Resc	urces Mgt	Tech	•	PROJECT 2523
(U) A. Project Co	ost Breakdown	(\$ in Thousan	ds)	ī	FY 1998	1	FY 1999		FY 2000	FY 2001			
				<u>ī</u>	<u>.</u>	ī							
(U) CCPL Compo		n			340		200		196	216			
(U) CCPL Product					344		0		0	0			
(U) Identify Enterp		S			0		360		0	0			
	Perform Suitability Testing Maintain Repository/Distribute Product Line				0		1,320		0	0			
					0		244		0	0			
(U) Identified as a	source for SBIR				0		70		0	0			
(U) Total					684		2,194		196	216			
(U) B. Budget Ac	equisition Histor	y and Plannii	ng Information	n (\$ in T	housands)							
Performing Organ	nizations:												
Contractor or	Contract												
Government	Method/Type	Award or	Performing	Project		Total							
Performing	or Funding	Obligation	Activity	Office		Prior to		dget	Budget	Budget	Budget	Budget to	Total
Activity	<u>Vehicle</u>	<u>Date</u>	EAC	<u>EAC</u>	<u>F</u>	Y 1998	<u>FY 1</u>	_	FY 1999	FY 2000	FY 2001	Complete	Program
Identified as a sour	ce for SBIR					C)	0	70	0	0	0	70
Product Developme	ent Organization	s											
Hughes	CPFF	19 Dec 92	N/A	N/A		453		458	65	65	72	Continuing	Continuing
Raytheon	CPFF	19 Dec 92	N/A	N/A		1,000		0	64	66	72	Continuing	Continuing
AGCS	CPFF	Dec 94	N/A	N/A		50		0	0	0	0	0	50
TRW	CPFF	12 Feb 97	N/A	N/A		0		190	65	65	72	Continuing	Continuing
Unisys	CPFF	29 Sep 93	N/A	N/A		30		0	0	0	0	0	30
WVA High Tech	NPLACE	18 Nov 96	N/A	N/A		0		0	1,732	0	0	0	1,732
Raytheon/Hughes /TRW	CPFF	20 Feb 97	N/A	N/A		0		0	192	0	0	0	192
Project 2523					Page	9 of 14	Pages			Exhi	bit R-3 (P	E 0604740F)

RD	T&E PRO	GRAM EL	.EMENT/F	PROJE	CT COST B	REAKD	OWN (R-	3)	DATE	February 1999			
BUDGET ACTIVITY 5 - Engineerin	ıg and Manı	ıfacturing	Developme	ent		R AND TITLE OF Comp	outer Resc	urces Mg	t Tech	-	PROJECT 2523		
Contractor or Government Performing Activity	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity EAC	Project Office <u>EAC</u>	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget <u>FY 2000</u>	Budget <u>FY 2001</u>	Budget to Complete	Total <u>Program</u>		
Support and Manag MOSAIC (TEMS) ATTI ESC Test and Evaluation Not applicable.	N/A N/A N/A	var Var Var N/A	N/A N/A N/A	N/A N/A N/A	178 22 247	0 0 36	0 0 0	0 0 0	0 0 0	0 0 Continuing	178 22 Continuing		
Government Furn Not applicable. Identified as source Subtotal Product De Subtotal Support ar Subtotal Test and E	for SBIR evelopment and Management				0 1,533 447 0	0 648 36 0	70 2,124 0 0	0 196 0	0 216 0 0	0 Continuing Continuing 0	70 Continuing Continuing 0		
Total Project					1,980	684	2,194	196	216	Continuing	Continuing		
Project 2523					Page 10 of 14 Pa	ages		Ext	nibit R-3 (P	E 0604740F)		

UNCLASSIFIED DATE RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) February 1999 BUDGET ACTIVITY PE NUMBER AND TITLE **PROJECT** 5 - Engineering and Manufacturing Development 0604740F Computer Resources Mgt Tech 2524 FY 1998 FY 1999 FY 2000 FY 2001 FY 2002 FY 2003 FY 2004 FY 2005 **Total Cost** Cost to COST (\$ In Thousands) Complete Actual Estimate Estimate Estimate Estimate Estimate Estimate Estimate 2524 Reuse and Component Support (RCS) 2,436 12,259 * Congress added an additional \$2.0 million in FY99 for the National Product Line Asset Center (NPLACE). These funds were inadvertently placed in project 2523 as opposed to project 2524. Funds will be transferred to project 2524 at the earliest opportunity. (U) A. Mission Description This project was renamed the Comprehensive Approach for Reusable Defense Software (CARDS) program. CARDS developed a reuse blueprint for DoD and established a reuse library. CARDS is a Congressional special interest item for which Congress has added funds in every FY since FY92 with the exception of FY97. CARDS identifies, tests, and provides reusable software components and products to the CCPL program. CARDS developed a software reuse strategy for the DoD; and is developing a Product Line Asset Center Software Reuse Repository to manage a command center product line based primarily on commercial off-the-shelf (COTS) products through the National Product Line Asset Center (NPLACE) contract vehicle. (U) FY 1998 (\$ in Thousands): 440 Identify Enterprise Wide Assets (From COTS, GOTS, Product line engineering centers). (U)

- (U) \$ 1,699 Perform suitability testing against product line architectures, assets, criteria, and design.
- (U) \$ 297 Maintain repository/distribute product line architecture, assets, criteria, and design.
- (U) \$ 2.436 Total

(U) <u>FY 1999 (\$ in Thousands)</u>:

– (U) \$ 0 Total

(U) <u>FY 2000 (\$ in Thousands)</u>:

– (U) \$ 0 Total

(U) <u>FY 2001 (\$ in Thousands)</u>:

– (U) \$ 0 Total

Project 2524 Page 11 of 14 Pages Exhibit R-2 (PE 0604740F)

DATE RDT&E BUDGET ITEM JUSTIFICATION SHEET (R-2A Exhibit) February 1999 **BUDGET ACTIVITY** PE NUMBER AND TITLE PROJECT 0604740F Computer Resources Mgt Tech 5 - Engineering and Manufacturing Development 2524 (U) B. Project Change Summary - Description of Significant Changes: Congress added \$3.0 million to the FY98 program as part of the FY98 appropriation for the Central Archive for Reusable Defense Software (CARDS) program and an additional \$2.0 million into the FY99 program for the National Product Line Asset Center (NPLACE). (U) C. Other Program Funding Summary (\$ in Thousands) Not applicable. (U) D. Acquisition Strategy All major contracts within this Program Element were awarded after full and open competition. (U) E. Schedule Profile Not applicable. This is a support and management level of effort program. All activities are ongoing. Exhibit R-2 (PE 0604740F) Project 2524 Page 12 of 14 Pages

RDT	&E PROC	GRAM EL	EMENT/F	PROJE	ECT COS	ST BR	REAKD	OWN (R-	3)	DATE F	ebruary 1	999	
BUDGET ACTIVITY 5 - Engineering	g and Manu	facturing [Developmo	ent		PE NUMBER AND TITLE 0604740F Computer Resources Mgt					PROJECT 2524		
(U) A. Project Cos	t Breakdown (\$ in Thousand	<u>ls)</u>										
				<u>F</u>	FY 1998	<u>FY 1</u>	.999	FY 2000	FY 2001				
(U) Identify Enterpri (U) Perform Suitabil (U) Maintain Reposi (U) Total	lity Testing				440 1,699 297 2,436		0 0 0 0	0 0 0 0	0 0 0 0				
(U) B. Budget Acq	uisition Histor	y and Plannin	g Informatio	n (\$ in Tl	housands)								
Performing Organiz	zations:				_								
Government Performing	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation <u>Date</u>	Performing Activity <u>EAC</u>	Project Office <u>EAC</u>	To Prio <u>FY 1</u> 9		Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget <u>FY 2001</u>	Budget to Complete	Tota <u>Program</u>	
Product Developmen Lockheed Martin	nt Organizations CPFF	<u>s</u> May 97	N/A	N/A		0	30	0	0	0	0	30	
Support and Manage	ment Organiza	tions											
Unisys AGCS WVA High Tech Raytheon/Hughes/T	CPFF CR NPLACE CPFF	29 Sep 93 Dec 94 18 Nov 96 20 Feb 97	N/A N/A N/A N/A	N/A N/A N/A		5,638 270 ,700 38	0 0 2,006 400	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	5,638 270 3,706 438	
RW ATTI	N/A	N/A	N/A	N/A		253	0	0	0	0	0	253	
Project 2524					Page 13 o	C 1 4 D			F.J.L.	hi+ D 2 /DF	: 0604740F)		

R	DT&E PRO	GRAM EL	.EMENT/F	PROJE	CT COST B	REAKDO	OWN (R-	3)	DATE F	DATE February 1999			
BUDGET ACTIVITY 5 - Engineer	ing and Manu	ıfacturing	Developme	ent		R AND TITLE OF Comp	outer Resc	ources Mg	t Tech	Tech PROJECT 2524			
Contractor or Government Performing Activity	Contract Method/Type or Funding <u>Vehicle</u>	Award or Obligation Date	Performing Activity EAC	Project Office <u>EAC</u>	Total Prior to FY 1998	Budget FY 1998	Budget FY 1999	Budget FY 2000	Budget FY 2001	Budget to Complete	Total <u>Program</u>		
Test and Evaluat Not applicable	ion Organizations												
Government Fur Not applicable.	rnished Property:	:											
Subtotal Product Subtotal Support Subtotal Test and	and Management				0 7,899 0	30 2,406 0	0 0 0	0 0 0	0 0 0	0 0 0	30 10,305 0		
Total Project					7,899	2,436	0	0	0	0	10,335		
Project 2524					Page 14 of 14 P	ggas		Evh	nibit R-3 (PE	0604740E)			